

MATH 123

syllabus

Fall, 2015

Professor: Matthew Neal (nealm@denison.edu)

Office and phone: Olin 202 (6288)

Office Hours: Tuesday 1:30 - 4:20, 5 - 6:30, Thursday 1:30 - 4:20, or by appointment

Web site: <http://personal.denison.edu/~nealm/>

Course

This is a course in single variable Calculus, which is that subset of mathematics concerned with the theory and application of **limits**. Limits are sequences of numbers (or other objects) that either get infinitely close to each other or grow infinitely large. Many useful mathematical constructions (such as a derivative, an integral, or many familiar functions) are built out of limits. These constructions are often crucial to our modeling of the physical world. For example, a derivative is simply the rate of change of one variable with respect to another. This models real world quantities like velocity, marginal profit, cooling rates, and population growth rates. An integral is simply the accumulation of one variable as another variable changes. This models probability, mass, work, total cost and other important real world concepts. The words “single variable” mean that we will only consider applications of limits to functions and variables that depend on one input variable. Math 124 extends these ideas to the multivariable case.

Audience

This course is intended for students who have successfully completed Math 121, or were placed into Math 123 via the Calculus Readiness Test. It is needed if you want to go further in Calculus and want to take Math 124 (Multivariable Calculus). Mathematics, science or economics students should consider taking Math 123 and Math 124.

Book

Calculus: Early Transcendentals 7th edition by Stewart

homework url and ebook text

You need to go to <https://www.webassign.net> and log in with your class key to do the regular homework. This key is **denison 9584 8440** for the **9:30 class** and **denison 5602 1311** for the **11:30 class**. After registering, you will enter the access code you purchased at the bookstore (or online) to get access to the assignments, in class problems, and the ebook version of the text.

Grades and Expectations

The grade will be calculated with the following weights:

- 17 % for each of four tests
- 16 % for homework
- 16 % Final exam

Grade Scale: 90-100 A 78-89 B 66-77 C 50-65 D 0-49 F

Final

The final takes place in our classroom on Tuesday, December 15th, 2-4 p.m. for the 9:30 class and Monday, December 14th, 6:30 - 8:30 p.m. for the 11:30 class

Tests

Tests occur every three weeks on Thursday evening from 7 - 9 pm starting September 17th. You are responsible to understand everything said in class or written in the text for the sections covered as well as every problem assigned. Note that "understand" does not mean "memorize" and problems on the test will not be identical to homework problems.

Homework

There are two types of homework. Unlike tests, you may work together on homework.

1. Daily online homework will be assigned using WebAssign. These problems are at easy to medium levels of difficulty and you get five attempts. I will spot you 20 % so If you get 80 % correct or more you get 100 % credit. This work makes up 50 % of the homework grade.
2. Challenge homework: A few challenging problems are assigned each week to be completed on paper and turned in each Wednesday. This comprises the other 50 % of the homework grade

Tutors

You will be assigned a student tutor for the class. He will be in Olin 215 from 7 - 9 on Sunday and Monday.

Late Work

Late tests will receive a 20 % point penalty per day late unless there is a written note (such as a note from Whistler) that verifies a VERY strong excuse (such as illness or important sports team events). Late quizzes and homework are not accepted at all without a similar excuse.

Office Hours

Please come to office hours so I can get to know you better!

Disabilities

Any student who feels he or she may need an accommodation based on the impact of a disability should contact me privately as soon as possible to discuss his or her specific needs. I rely on the Academic Support and Enrichment Center in 104 Doane to verify the need for reasonable accommodations based on documentation on file in their office.

Academic Integrity

The students and faculty of Denison University and the Department of Mathematics and Computer Science are committed to academic integrity and will not tolerate any violation of this principle. Academic honesty, the cornerstone of teaching and learning, lays the foundation for lifelong integrity.

Academic dishonesty is, in most cases, intellectual theft. It includes, but is not limited to, providing or receiving assistance in a manner not authorized by the instructor in the creation of work to be submitted for evaluation. This standard applies to all work ranging from daily homework assignments to major exams. Students must clearly cite any sources consulted, not only for quoted phrases but also for ideas and information that are not common knowledge. Neither ignorance nor carelessness is an acceptable defense in cases of plagiarism. It is the students' responsibility to follow the appropriate format for citations.

Proposed and developed by Denison students, passed unanimously by DCGA and Denisons faculty, the Code of Academic Integrity requires that instructors notify the Associate Provost of cases of academic dishonesty, and it requires that cases be heard by the Academic Integrity Board. Further, the code makes students responsible for promoting a culture of integrity on campus and acting in instances in which integrity is violated.

For further information about the Code of Academic Integrity see <http://www.denison.edu/about/integrity.html>

Topics and Schedule

- Week 0: 2.2 Limits (introduce through velocity problem)
- Week 1: 2.3, 2.5, 2.6, Computing limits, continuity, limits at infinity,
- Week 2: 2.7, 2.8, 3.1 Derivatives and rates of change, the derivative as a function, Derivatives of polynomials,
- Week 3: 3.2, 3.3 Product and quotient rules, **Test #1 Thursday Sept. 17th**, derivatives of trig functions
- Week 4: 3.4, 3.5 Chain rule, implicit differentiation
- Week 5: 3.6, 3.7, 3.8 Derivatives of logarithmic functions, rates of change in the natural and social sciences, Exponential growth.
- Week 6: 9.2, 4.1 Logistic equation, **Test #2 Thursday Oct 8th**, Maximum and Minimum values
- Week 7: 4.3, 4.4 How derivatives affect the shape of a graph, indeterminate forms and L'Hopital's rule, study break.
- Week 8: 4.5, 4.7 Curve sketching, optimization
- Week 9: 4.7, 4.8 Optimization, **Test #3 Thursday Oct 29th**, Newton's method
- Week 10: 4.9, 5.1, 5.2 Antiderivatives, area and distance, definite integrals,
- Week 11: 5.3, 5.4, 5.5 Fundamental Theorem of Calculus, Indefinite integrals, substitution
- Week 12: 5.5, 6.1 Substitution, area between curves, **Test #4 Thursday November 19th**
- Week 13: 6.2, 6.4, 6.5 Volume, work, average value and optimization
- Week 14: 7.1, 8.5 Integration by parts, Probability